

WHAT IS CLAIMED IS:

1. An ultracentrifuge tube comprising an upper region, a middle region and a lower region wherein an inner diameter of said upper region is larger than an inner diameter of said middle region, wherein (i) an inner diameter of said middle region is larger than an inner diameter of said lower region or (ii) the inner diameter of said middle region is the same as the inner diameter of said lower region, wherein that inner diameter is small enough to trap an air bubble between two layers of aqueous liquid such that the air bubble will keep said two layers of aqueous liquid separate so long as said centrifuge tube is at rest, and wherein said lower region has a closed bottom.
2. The ultracentrifuge tube of claim 1, wherein said inner diameter of said lower region is smaller than 0.25 inch.
3. The ultracentrifuge tube of claim 1, wherein said lower region is at least 5% of the total length of said tube.
4. The ultracentrifuge tube of claim 1, wherein the inner surfaces are polished by vapor polishing.
5. The ultracentrifuge tube of claim 1, wherein the inner surfaces are coated with adhering polymer to prevent adsorption of biological particles.
6. The ultracentrifuge tube of claim 1, wherein said tube is prepared from materials such that said tube can be centrifuged at velocities high enough to band viruses in CsCl gradients without said tube breaking.
7. The ultracentrifuge tube of claim 1, wherein said tube is prepared from materials such that said tube can be centrifuged at velocities high enough to band mycoplasmas in CsCl gradients without said tube breaking.

8. The ultracentrifuge tube of claim 1, wherein said tube is prepared from materials such that said tube can be centrifuged at velocities high enough to band rickettsia in CsCl gradients without said tube breaking.
9. The ultracentrifuge tube of claim 1, wherein said tube is prepared from materials such that said tube can be centrifuged at velocities high enough to band yeast in CsCl gradients without said tube breaking.
10. The ultracentrifuge tube of claim 1, wherein said tube is prepared from materials such that said tube can be centrifuged at velocities high enough to band bacteria in CsCl gradients without said tube breaking.
11. The ultracentrifuge tube of claim 1, wherein said tube is made of polycarbonate.
12. The ultracentrifuge tube of claim 1, wherein said upper region, middle region and lower region have outer diameters equal to each other.
13. The ultracentrifuge tube of claim 1, wherein said upper region has an outer diameter larger than an outer diameter of said lower region.
14. The ultracentrifuge tube of claim 1, wherein said inner diameter of said lower region is smaller than 0.1 inch.
15. The ultracentrifuge tube of claim 1, wherein said inner diameter of said lower region is in the range 0.08 - 0.1 inch.
16. The ultracentrifuge tube of claim 1, wherein said inner diameter of said lower region is in the range 0.039 - 0.08 inch.
17. The ultracentrifuge tube of claim 1, wherein said inner diameter of said lower region is 0.064 inch.

18. An ultracentrifuge tube comprising an upper region, a middle region and a lower region wherein an inner diameter of said upper region is larger than an inner diameter of said lower region, wherein said upper region is separated from said lower region by said middle region having a decreasing diameter from said upper region toward said lower region and wherein said lower region has a closed bottom.

19. The ultracentrifuge tube of claim 18, wherein said middle region comprises one or more serrations.

20. The ultracentrifuge tube of claim 18, wherein said lower region has an inner diameter small enough to trap an air bubble between two layers of liquid such that the air bubble will keep said two layers of liquid separate so long as said centrifuge tube is at rest.

21. The ultracentrifuge tube of claim 18, wherein said inner diameter of said lower region is smaller than 0.25 inch.

22. The ultracentrifuge tube of claim 18, wherein said lower region is at least 5% of the total length of said tube.

23. The ultracentrifuge tube of claim 18, wherein the inner surfaces are polished by vapor polishing.

24. The ultracentrifuge tube of claim 18, wherein the inner surfaces are coated with adhering polymer to prevent adsorption of biological particles.

25. The ultracentrifuge tube of claim 18, wherein said tube is prepared from materials such that said tube can be centrifuged at velocities high enough to band viruses in CsCl gradients without said tube breaking.

26. The ultracentrifuge tube of claim 18, wherein said tube is prepared from materials such that said tube can be centrifuged at velocities high enough to band mycoplasmas in CsCl gradients without said tube breaking.

27. The ultracentrifuge tube of claim 18, wherein said tube is prepared from materials such that said tube can be centrifuged at velocities high enough to band rickettsia in CsCl gradients without said tube breaking.

28. The ultracentrifuge tube of claim 18, wherein said tube is prepared from materials such that said tube can be centrifuged at velocities high enough to band yeast in CsCl gradients without said tube breaking.

29. The ultracentrifuge tube of claim 18, wherein said tube is prepared from materials such that said tube can be centrifuged at velocities high enough to band bacteria in CsCl gradients without said tube breaking.

30. The ultracentrifuge tube of claim 18, wherein said tube is made of polycarbonate.

31. The ultracentrifuge tube of claim 18, wherein said upper region, middle region and lower region have outer diameters equal to each other.

32. The ultracentrifuge tube of claim 18, wherein said upper region has an outer diameter larger than an outer diameter of said lower region.

33. The ultracentrifuge tube of claim 18, wherein said inner diameter of said lower region is smaller than 0.1 inch.

34. The ultracentrifuge tube of claim 18, wherein said inner diameter of said lower region is in the range 0.08 - 0.1 inch.

35. The ultracentrifuge tube of claim 18, wherein said inner diameter of said lower region is in the range 0.039 - 0.08 inch.

36. The ultracentrifuge tube of claim 18, wherein said inner diameter of said lower region is 0.064 inch.

37. An ultracentrifuge tube comprising an upper centripetal region having a cylindrical shape, a middle region having a cylindrical shape and a lower centrifugal region having a cylindrical shape, wherein an inner diameter of said upper region is larger than an inner diameter of said lower region, wherein said upper region is separated from said lower region by said middle region having a decreasing diameter from said upper region toward said lower region and wherein said lower region has a closed bottom.

38. The ultracentrifuge tube of claim 37, wherein said middle region comprises one or more serrations.

39. The ultracentrifuge tube of claim 37, wherein said lower region has an inner diameter small enough to trap an air bubble between two layers of liquid such that the air bubble will keep said two layers of liquid separate so long as said centrifuge tube is at rest.

40. The ultracentrifuge tube of claim 37, wherein said inner diameter of said lower region is smaller than 0.25 inch.

41. The ultracentrifuge tube of claim 37, wherein said lower region is at least 5% of the total length of said tube.

42. The ultracentrifuge tube of claim 37, wherein the inner surfaces are polished by vapor polishing.

43. The ultracentrifuge tube of claim 37, wherein the inner surfaces are coated with adhering polymer to prevent adsorption of biological particles.

44. The ultracentrifuge tube of claim 37, wherein said tube is prepared from materials such that said tube can be centrifuged at velocities high enough to band viruses in CsCl gradients without said tube breaking.

45. The ultracentrifuge tube of claim 37, wherein said tube is prepared from materials such that said tube can be centrifuged at velocities high enough to band mycoplasmas in CsCl gradients without said tube breaking.

46. The ultracentrifuge tube of claim 37, wherein said tube is prepared from materials such that said tube can be centrifuged at velocities high enough to band rickettsia in CsCl gradients without said tube breaking.

47. The ultracentrifuge tube of claim 37, wherein said tube is prepared from materials such that said tube can be centrifuged at velocities high enough to band yeast in CsCl gradients without said tube breaking.

48. The ultracentrifuge tube of claim 37, wherein said tube is prepared from materials such that said tube can be centrifuged at velocities high enough to band bacteria in CsCl gradients without said tube breaking.

49. The ultracentrifuge tube of claim 37, wherein said tube is made of polycarbonate.

50. The ultracentrifuge tube of claim 37, wherein said upper region, middle region and lower region have outer diameters equal to each other.

51. The ultracentrifuge tube of claim 37, wherein said upper region has an outer diameter larger than an outer diameter of said lower region.

52. The ultracentrifuge tube of claim 37, wherein said inner diameter of said lower region is smaller than 0.1 inch.

53. The ultracentrifuge tube of claim 37, wherein said inner diameter of said lower region is in the range 0.08 - 0.1 inch.

54. The ultracentrifuge tube of claim 37, wherein said inner diameter of said lower region is in the range 0.039 - 0.08 inch.

55. The ultracentrifuge tube of claim 37, wherein said inner diameter of said lower region is 0.064 inch.